

sequence that exhibits at least 85%, 86%, 87%, 88%, 89%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, 99% or more sequence identity to SEQ ID NO: 1 or is a portion thereof that is enzymatically active. In particular embodiments of any of the provided methods, the PNGase F comprises the amino acid sequence set forth in SEQ ID NO: 1. In some embodiments of any of the provided methods, the PNGase F comprises a tag, optionally an affinity tag. In certain embodiments of any of the provided methods, the tag is a poly-histidine (His-tag).

[0011] In particular embodiments of any of the provided methods, the PNGase F is greater than or greater than about 90%, greater than or greater than about 92%, greater than or greater than about 95%, or greater than or greater than about 98% pure; and/or the PNGase F comprises less than or less than about 10%, less than or less than about 8%, less than or less than about 5%, less than or less than about 2% non-PNGase F protein contaminants; and/or the PNGase F is greater than or greater than about 90%, greater than or greater than about 92%, greater than or greater than about 95%, or greater than or greater than about 98% homogeneous, optionally as determined by SDS-PAGE and protein staining, optionally Coomassie Blue staining.

[0012] In some embodiments of any of the provided methods, the N-glycosidase, optionally PNGase F, is in an enzymatically effective amount to release the one or more N-glycans from a native or non-denatured glycoprotein or glycoproteins and/or from the cells of the cell composition after incubation for no more than 12 hours at a temperature between 35° C. and 39° C., optionally about 37° C. In certain embodiments of any of the provided methods, the enzymatically effective amount is an amount to release the one or more N-glycans after incubation for no more than 15 minutes to 3 hours or 30 minutes to 2 hours, at a temperature between 25° C. and 39° C. or between 35° C. and 39° C., each inclusive, optionally about 37° C. In particular embodiments of any of the provided methods, the enzymatically effective amount of PNGase F releases greater than 50%, greater than 55%, greater than 60%, greater than 65%, greater than 70%, greater than 75%, greater than 80%, greater than 85%, greater than 90%, greater than 95%, greater than 99% of N-glycans present on the glycoprotein or glycoproteins and/or present on the surface of the cell composition. In some embodiments of any of the provided methods, the conditions of the incubation are sufficient to effect release of greater than 50%, greater than 55%, greater than 60%, greater than 65%, greater than 70%, greater than 75%, greater than 80%, greater than 85%, greater than 90%, greater than 95%, greater than 99% N-glycans present on the surface of the test cell composition.

[0013] In certain embodiments of any of the provided methods, the amount of N-glycosidase, optionally PNGase F, is 1 unit to 5000 units, 1 unit to 1000 units, 1 unit to 500 units, 1 unit to 250 units, 1 unit to 100 units, 1 unit to 50 units, 1 unit to 25 units, 25 units to 5000 units, 25 units to 1000 units, 25 units to 500 units, 25 units to 250 units, 25 units to 100 units, 25 units to 50 units, 50 units to 5000 units, 50 units to 1000 units, 50 units to 500 units, 50 units to 250 units, 50 units to 100 units, 100 units to 5000 units, 100 units to 1000 units, 100 units to 500 units, 100 units to 250 units, 250 units to 5000 units, 250 units to 1000 units, 250 units to 500 units, 500 units to 5000 units, 500 units to 1000 units, or 1000 units to 5000 units, each inclusive. In particular embodiments of any of the provided methods, the amount of

N-glycosidase, optionally PNGase F, is greater than or greater than about or is or is about 1 unit, 5 units, 10 units, 15 units, 20 units, 25 units, 50 units, 100 units, 250 units, 500 units, 1000 units, 2500 units or 5000 units. The method of claim 27 or claim 28, wherein one unit is an amount of the N-glycosidase, optionally PNGase F, sufficient to catalyze the deglycosylation of 1 nanomole of denatured Ribonuclease B (RNase B) in 30 minutes at 37° C. In some embodiments of any of the provided methods, 500 units is an amount of the N-glycosidase, optionally PNGase F, sufficient to catalyze the deglycosylation of 10 µg of Ribonuclease B (RNase B) incubated in 1XPBS for 5-10 minutes at 37° C. or room temperature.

[0014] In certain embodiments of any of the provided methods, the incubating the test composition is for an amount of time that between or between about 5 minutes and 12 hours, 30 minutes and 6 hours or 1 hour and 3 hours, each inclusive. In particular embodiments of any of the provided methods, the incubating the test composition is for at least or at least about or is or is about 5 minutes, about 10 minutes, about 15 minutes, 30 minutes, 1 hour, 2 hours 3 hours, 4 hours, 5 hours or 6 hours. In some embodiments of any of the provided methods, the incubating the test composition is for about 30 minutes. In certain embodiments of any of the provided methods, the incubating the test composition is at a temperature between 25° C. and 39° C. or between 35° C. and 39° C. In particular embodiments of any of the provided methods, the incubating the test composition is at a temperature of about 37° C. In some embodiments of any of the provided methods, the incubating the test composition is for about 30 minutes at a temperature of about 37° C.

[0015] In certain embodiments of any of the provided methods, prior to the determining the presence, absence, identity and/or level of glycans present in a sample, the method further comprises labeling glycans from the sample with a detectable label, optionally a fluorescent label. In particular embodiments of any of the provided methods, the label is a fluorescent label and the fluorescent label is or comprises 2-aminobenzamide (2-AB), 2-aminobenzoic acid (2-AA), 2-aminopyridine (PA), 2-Aminoacridone (AMAC), 2-aminonaphthalene trisulfonic acid (ANTS), and 1-aminopyrene-3,6,8-trisulfonic acid (APTS), 3-(Acetylamino)-6-aminoacridin (AA-Ac), 6-Aminoquinoline (6-AQ), 7-Aminomethyl-coumarin (AMC), 2-Amino (6-amido-biotinyl) pyridine (BAP), 9-Fluorenylmethoxycarbonyl (Fmoc)-hydrazide, 1,2-Diamino-4,5-methylenedioxy-benzene (DMB), or o-Phenylenediamine (OPD). In some embodiments of any of the provided methods, the fluorescent label comprises a quinolinyl fluorophore. In certain embodiments of any of the provided methods, the fluorescent label comprises a carbamate tagging group. In particular embodiments of any of the provided methods, the fluorescent label comprises a basic tertiary amine. In some embodiments of any of the provided methods, the fluorescent label comprises a carbamate tagging group, a quinolone fluorophore, and a tertiary amine.

[0016] In certain embodiments of any of the provided methods, prior to determining the presence, absence, identity and/or level of the one or more glycans, the sample is subjected to glycan purification or enrichment. In particular embodiments of any of the provided methods, glycan purification or enrichment is carried out by solid phase extraction (SPE).

[0017] In some embodiments of any of the provided methods, determining the presence, absence, or level of the